

REMARKS

The Office Action dated March 25, 2010, and subsequent Advisory Action dated July 6, 2010, have been received and carefully noted. The following remarks are submitted in conjunction with Applicants' Response dated June 25, 2010 ("the Response"), and the enclosed Request for Continued Examination, as a full and complete response thereto. Claims 2, 8, 11, 13, 14 and 16-19 are currently pending in the application, of which claims 2 and 11 are independent claims.

Applicants respectfully request reconsideration of claims 2, 8, 11, 13, 14 and 16-19, and timely withdrawal of the pending claim rejections for the reasons discussed below.

Claims 2, 8, 11, 13, 14 and 16-19 remain rejected under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. Specifically, the Office Action alleged that these claims contain subject matter which was not described in the specification in such a way as to reasonably convey to a person skilled in the relevant art that Applicants, at the time the application was filed, had possession of the claimed invention. It should be noted that claims 2 and 11 have been amended pursuant to the Response.

Regarding claims 2 and 11, the Office Action alleged that the specification does not provide sufficient support for a "first portion" and a "second portion," as set forth in the pending claims. The Advisory Action alleged that the specification, on page 18, line

16, to page 19, line 8, fails to provide sufficient support for these claimed features of the invention. Applicants respectfully traverse this rejection.

Applicants' specification provides sufficient support for a "first portion" and a "second portion" of a layered Fe-based alloy member, as recited in claims 2, 8, 11, 13, 14 and 16-19. The specification, at least, on page 18, line 16, to page 19, line 8, clearly discloses providing a layered Fe-based alloy member with desired properties only on a certain part of the forging punch 10. The specification discloses that a coating (*i.e.*, diffusion layer 20 of a metal carbide element) is applied to a workpiece-pressing part 16 (*i.e.*, "a first portion") of the forging punch 10. Whereas, a large section 12 and a diametrically reduced section 14 (*i.e.*, "a second portion") of the forging punch 10 do not have the diffusion layer 20 applied thereto. As a result, the Fe-based alloy member has desired properties along specific portions of the member. A person of ordinary skill in the relevant art would have clearly understood that the diffusion layer 20 in the workpiece-pressing part 16 of the forging punch 10 would have different properties from the large section 12 and the diametrically reduction section 14 of the forging punch 10 because of diffusion layer 20.

Accordingly, Applicants' specification provides sufficient support for a "first portion" and a "second portion" of the layered Fe-based alloy member, as recited in claims 2, 8, 11, 13, 14 and 16-19, to satisfy the written description requirement of 35 U.S.C. §112, first paragraph. Applicants respectfully request withdrawal of the rejection

and reconsideration of claims 2, 8, 11, 13, 14 and 16-19. Applicants respectfully submit that claims 2, 8, 11, 13, 14 and 16-19 are in condition for allowance.

Claims 2, 8, 11, 13, 14 and 16-19 remain rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. The Advisory Action alleged that the arguments presented in the Response with regard to this rejection are moot, since they rely upon the entry of the amendments to claims 2 and 11.

Applicants respectfully request reconsideration of the arguments presented in the Response in view of the entry of the amendments to claims 2 and 11. In summary, Applicants have amended claim 2 to replace “the material” with “the second element,” and claim 11 to recite, in part, “applying, to a surface of said Fe-based alloy member at the first portion, a powder comprising a substance that comprises said first element,” rendering this rejection moot. Applicants respectfully request withdrawal of this rejection and reconsideration of claims 2, 8, 11, 13, 14 and 16-19. Applicants respectfully submit that claims 2, 8, 11, 13, 14 and 16-19 are in condition for allowance.

Claims 2, 8 and 16-19 remain rejected under 35 U.S.C. §102(b) as being allegedly anticipated by, or in the alternative, under 35 U.S.C. §103(a) as being allegedly unpatentable over Kaufman. The Office Action alleged that since Kaufman discloses substantially similar steps of treating the same or substantially the same composition, as recited in claims 2, 8 and 16-19, the thickness of the coating and the properties of the carbide, as recited in these claims, would be expected. Alternatively, the Office Action

alleged that it would have been obvious to one having ordinary skill in the art to modify the size/quantity of the particles of alloy additive power having ingredients, such as manganese, nickel and molybdenum, such that a thickness of 0.5 mm would be met since the ratio of base alloy powder to additive alloy powder is result-effective in terms of compressibility and cost.

The Advisory Action alleged that Kaufmann need not disclose that only a certain portion of the alloy parts be sintered in order to disclose the features recited in claims 2, 8, and 16-19. The Examiner further alleged that the “certain portion” referred to by Applicants is not distinguished in Applicants’ specification to be a “first portion” or a “second portion.” The Advisory Action further alleged that “a first portion” could include or be a part of “a second portion,” since Applicants failed to provide a definition for these phrases in the specification.

Applicants respectfully submit that a person of ordinary skill in the relevant art would have clearly understood, based on the specification, at least, on page 18, line 16, to page 19, line 8, that the workpiece-pressing part 16, as “a first portion,” and the large section 12 and a diametrically reduced section 14, as “a second portion” are separate and distinct elements of the forging punch 10. As further illustrated, at least, in Figures 1 and 4a to 4f, the workpiece-pressing part 16 would not include the large section 12 and a diametrically reduced section 14 of the forging punch 10. Therefore, contrary to the allegations presented in the Office Action, Applicants’ specification clearly defines a “first portion” and a “second portion,” as recited in claims 2, 8 and 16-19.

As discussed in the Response, Kaufmann fails to disclose or suggest, at least,

a coating disposed on an outer surface of a first portion of the layered Fe-based alloy member, wherein the coating comprises a carbide formed by carbonizing a first element that comprises a property to increase a hardness of the layered Fe-based alloy member at the first portion, and wherein the coating further comprises a thickness of at least 0.5 mm; and

a second element disposed in a second portion of the layered Fe-based alloy member, wherein the material comprises an amount that is greater on the outer surface than at an inside portion of the layered Fe-based alloy member,

wherein a hardness of the layered Fe-based alloy member at the first portion is greater at the inside portion than on the outer surface of the layered Fe-based alloy member,

as recited in claims 2, 8, and 16-19 (emphasis added). As discussed in the Response, Kaufmann discloses that a coating of a Fe-C alloy powder is *unevenly distributed* on the entire surface of a sintered body (*i.e.*, the entire surface of each alloy part is sintered). Therefore, as further discussed in the Response, Kaufman fails to disclose or suggest that *only a first portion* of the alloy parts is sintered with a coating for increasing the hardness at that first portion, while *other parts* of the member (*i.e.*, a second portion) are not coated with the coating.

Applicants respectfully submit that the Office Action and the Advisory Action failed to demonstrate that every element recited in claims 2, 8, and 16-19 is anticipated by, or in the alternative, obvious over Kaufman. Furthermore, claims 8 and 16-19 depend from, and further limit, claim 2. Accordingly, claims 8 and 16-19 should be allowable for at least their dependency upon an allowable base claim. Applicants respectfully

request withdrawal of the rejection and reconsideration of 2, 8 and 16-19. Applicants respectfully submit that claims 2, 8 and 16-19 are in condition for allowance.

Claims 2, 8, and 16-19 remain rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Tahara alone, or alternatively, in view of the ASM Handbook, Volume 4, Heat Treating (“ASM Handbook”). The Office Action alleged that Tahara discloses every element recited in claim 2. In the alternative, the Office Action alleged that Tahara discloses every element recited in claim 2, with the exception of specifying the thickness of the carburized layer. The Office Action alleged that the ASM Handbook cures the deficiencies of Tahara. Applicants respectfully submit that claims 2, 8, and 16-19 recite subject matter that is neither disclosed nor suggested by a combination of Tahara and the ASM Handbook.

Tahara and the ASM Handbook, whether taken individually or in combination, fail to disclose or suggest the features for the “first portion” and the “second portion,” as recited in claims 2, 8 and 16-19. As discussed in the Response, a person of ordinary skill in the relevant art would have understood that in a process of carbonizing, as discussed in Tahara, a carbide layer (*e.g.*, a hardened layer) is *unevenly distributed* at a surface layer portion (*i.e.*, on an outer surface) of the steel. Tahara fails to disclose that “a hardness of the layered Fe-based alloy member at the first portion is greater at the inside portion than on the outer surface of the layered Fe-based alloy member,” as recited in claims 2, 8, and 16-19 (*emphasis added*). The Office Action and the Advisory Action failed to address this argument.

The ASM Handbook fails to cure the deficiencies of Tahara. The ASM Handbook fails to disclose or suggest, at least, a “first portion” and a “second portion,” as recited in claims 2, 8, and 16-19. The Office Action alleged that the steel and the case, as disclosed in the ASM Handbook, define “a first portion” and “a second portion.” Applicants respectfully disagree with this allegation.

The ASM Handbook discloses the hardening of a case using a carburizing process in which carbon is dissolved in the surface layers of a low-carbon steel part of the case. Therefore, a person of ordinary skill in the relevant art would have understood that the steel part is a portion of the case (*i.e.*, a first portion of the whole). Whereas, embodiments of the invention provide “a first portion” and “a second portion” of the forging punch 10 (*i.e.*, two separate and distinct parts of the whole). One would not have considered the steel and the case, as disclosed in the ASM Handbook, as the “first portion” and the “second portion” of the member, as recited in claims 2, 8 and 16-19, since they are not separate and distinct elements.

Furthermore, neither Tahara nor the ASM Handbook discloses or suggests, at least, a coating that comprises “a thickness of at least 0.5 mm,” as recited in claims 2, 8, and 16-19. The Office Action and the Advisory Action alleged that the limitation for the coating “comprising a thickness of at least 0.5 mm,” as recited in line 5 of claim 2, is not sufficient to distinguish the subject matter of the claims from the prior art references because the limitation *merely changes the proportion (thickness) of a prior art product* (*see* Office Action on page 6). In the alternative, the Office Action and the Advisory

Action alleged that Tahara fails to specify the thickness of the carburized layer. The Office Action and the Advisory Action referred to the description in the ASM Handbook to allege that modifying time and/or temperature may achieve a carburized layer thickness greater than 1 mm, and, therefore, it would have been obvious to a person of ordinary skill in the relevant art to have modified the time and temperature for the process discussed in Tahara to achieve any desired carburized layer thickness (*see* Advisory Action on page 3). The Office Action and the Advisory Action further alleged that the carburizing time and temperature directly impacting the depth of carbon diffusion is well known in the art, and therefore larger carburized depths are desirable when wear resistance at lower depths within a material are desired. Applicants respectfully disagree with these allegations.

The Office Action failed to demonstrate that a person of ordinary skill in the relevant art would have found it obvious to exceed the carburizing depth discussed in Tahara by a magnitude of over *eight times*, when Tahara explicitly discloses that the *maximum* depth of the carburized layer is *limited* to 70 μm . Furthermore, although one could have known from the ASM Handbook that carburizing time and temperature directly impact the depth of carbon diffusion, one would not have looked to modify Tahara, as alleged in the Office Action and the Advisory Action, because Tahara explicitly teaches away from a carburizing layer thickness having a magnitude of at least 0.5 mm. Tahara also fails to disclose or suggest a desire to have a wear resistance at lower depths within a material, and therefore there is no motivation to provide larger

carburized depths. Modifying Tahara to provide a carburizing layer thickness of at least 0.5 mm would render Tahara unsatisfactory for its intended purpose. Tahara alone, or in the alternative, in combination with the ASM Handbook fails to disclose or suggest the thickness of the carburizing layer recited in claims 2, 8, and 16-19. Assuming *arguendo* that Tahara could be combined with the ASM Handbook, such a combination fails to disclose or suggest every element recited in claims 2, 8, and 16-19.

Furthermore, claims 8 and 16-19 depend from, and further limit, claim 2. Accordingly, claims 8 and 16-19 should be allowable for at least their dependency upon an allowable base claim. Applicants respectfully request withdrawal of the rejection and reconsideration of claims 2, 8, and 16-19. Applicants respectfully submit that claims 2, 8 and 16-19 are in condition for allowance.

Claims 2, 8, 11, 13, 14 and 16-19 remain rejected under 35 U.S.C. §103(a) as being allegedly unpatentable over Wang. The Office Action acknowledged that Wang fails to explicitly disclose every element recited in these claims. The Office Action alleged that it would have been obvious to a person of ordinary skill in the relevant art to modify the temperature of the coating to form the desired coating thickness recited in these claims. Applicants respectfully submit that claims 2, 8, 11, 13, 14, and 16-19 recite subject matter that is neither disclosed nor suggested by Wang.

Wang fail to disclose or suggest the features for the “first portion” and the “second portion,” as recited in claims 2, 8, 11, 13, 14 and 16-19. The Advisory Action alleged that the claims do not preclude the members from being coated with a carbide. The

Advisory Action referred to column 3, lines 3-15 of Wang to allege that carbon, as a second element, is drawn by the niobium and/or vanadium from the substrate steel to the surface to form the carbide layer, thereby forming a surface layer with more carbon compared with the inside of the steel article. The Advisory Action further referred to column 3, lines 44-45 of Wang to allege that chromium, as a first element, is drawn in a small amount from the steel substrate in the vanadium and/or niobium coating, whereby chromium increases from the surface layer to the inside portion of the steel article.

Applicants respectfully disagree with these allegations.

As discussed in the Response, the members disclosed in Wang *are completely coated with the carbide*, and therefore carbide is coated at *every portion* of the members disclosed in Wang. A person of ordinary skill in the relevant art would have understood that the hardness of the members disclosed in Wang would be uniform throughout. As illustrated in Figures 1 and 4a to 4f and recited in claims 2, 8, 11, 13, 14, and 16-19, a carbide coating is only applied to a first portion of the layered Fe-based alloy member. As previously discussed, the “first portion” and the “second portion” are separate and distinct elements of the member, and therefore the claims clearly recite that only the “first portion” is coated with carbide. Wang fails to disclose or suggest this distinction.

Furthermore, Applicants respectfully disagree that Wang, at column 3, lines 44-55, discloses that the “second element comprises an amount that is greater on the surface than at an inside portion,” as recited in the pending claims. Wang, at column 3, lines 44-55, merely discloses that carbon migrates to displace the halide from newly deposited

vanadium or niobium halide to form the chromium carbide. As discussed in the Response, only carbon diffuses toward a surface of the steel, and a composition ratio of vanadium or niobium does not change. Therefore, one would have understood that Wang fails to disclose or suggest that the composition of the layered Fe-based alloy member “at the first portion is greater at the inside portion than on the outer surface of the layered Fe-based alloy member,” as recited in claims 2, 8, and 16-19 (emphasis added), and similarly recited in claims 11, 13, and 14. Wang fails to disclose that there is a greater amount of the chromium on the surface as compared to an inside portion of the members. Wang fails to disclose or suggest every element recited in claims 2, 8, 11, 13, 14 and 16-19.

Furthermore, claims 8 and 16-19 depend from, and further limit, claim 2. Claims 13 and 14 depend from, and further limit, claim 11. Accordingly, claims 8, 13, 14, and 16-19 should be allowable for at least their dependency upon an allowable base claim. Applicants respectfully request withdrawal of the rejection and reconsideration of claims 2, 8, 11, 13, 14 and 16-19. Applicants respectfully submit that claims 2, 8, 11, 13, 14 and 16-19 are in condition for allowance.

Applicants respectfully request reconsideration of claims 2, 8, 11, 13, 14, and 16-19. Applicants respectfully submit that claims 2 and 11, and the claims that depend therefrom, are now in condition for allowance.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by

telephone, Applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

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Enclosures: RCE Transmittal
Petition for Extension of Time